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PENTOBARBITAL SODIUM (NEMBUTAL) SEDATION IN HORSES

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In equine surgical practice there has always been a need for an agent which could be administered easily and which would quieten a fractious animal while minor interferences were performed or more definite means of restraint applied ; for example, the adjustment of casting gear. This requirement is greater in the case of young unhandled horses, cryptorchids and nymphomaniacs. When attending such cases in a confined space in the company of a large body of enthusiastic students there is always a danger of injury to patient or personnel. In connection with the major surgical operations, a considerable part of the surgeon's concern is that the patient shall be cast without mishap. The quest for a drug which would expedite this process has been pursued through the years.

Schlotthauer (1949) was the first to suggest the use of pentobarbital sodium (nembutal) to fulfil the above requirements, and he adopted a dosage scale of 1 grain of the drug per 100 lb. of bodyweight. During the period November, 1952, to March, 1953, the present writers have confirmed that this drug is a useful sedative for the horse when administered intravenously in similar dosage. Their opinion is based on the observations made in nine instances involving seven horses which were selected from the surgical cases received at the College Hospital as being of a temperament likely to give the necessary information to affirm or negative Schlotthauer's contention.

It cannot be emphasised too strongly that in this study it was not the intention to use pentobarbital sodium as a narcotic or anaesthetic. This aspect of the pharmacology of the drug has already been investigated by Wright (1941). He concluded that it was unsuitable as an anaesthetic or basal narcotic for the adult horse and mentioned the danger of hyperaesthesia when small doses of the order of 25 to 35 grains were given and the marked narcotic excitement which might occur during induction and recovery. The previous experience of the writers had confirmed this view. In the work described in this report the aim was to produce sedation only, and, using the small dose suggested by Schlotthauer, there has not been any sign of hyperaesthesia.

In regard to the use of pentobarbital sodium as a sedative prior to major surgical operations, involving casting and the induction of general anaesthesia, the advantages of the method are considerable. In the first place, the sedation produced facilitates the handling of the patient and the application of the necessary restraint. In addition, the tenseness and muscular contraction of the animal at the time of casting are largely obviated so that accidents such as rupture of the diaphragm and vertebral fractures are less likely to occur. Furthermore, the induction of general anaesthesia is expedited. This was well illustrated in the case (No. 7 in the series reported below) where chloroform was administered in the standing position, in which animal there was little reaction to the application of the volatile agent to the patient's nose and a minimum of movement during the ensuing narcosis. Similarly, with the patient standing, the surgeon can be assured of a period of quietude during which a large bulk of chloral hydrate solution may be injected slowly into the jugular vein without the risk of abrupt movement of the horse causing dislodgment of the needle from the vein.

Comparable effects were seen in horses in the recumbent position. In all instances, and this was best shown where regional anaesthesia was employed, there was considerably less struggling against restraint, thus rendering more remote the likelihood of injuries associated with the casting process.

There is little doubt that when used in such small quantities the sedative effect of pentobarbital sodium is of short duration. Hence, from the moment of its administration there should be no delay in carrying out the proposed interference. The short action of the drug was an advantage in that it had no observable effect in prolonging recumbency and all patients got up without difficulty. There were no untoward sequelae or side-effects. In three of the nine instances there was a very slight, and immaterial, inco-ordination of gait. It is possible that this was due to errors in the estimates made of the animals' weights with consequent relative overdosage.

The technique of intravenous administration was standard, using a 10 or 20 c.c. " Record " syringe fitted with a 1-inch or 2-inch hypodermic needle of No. 19 BWG. Prior to the injection, an " anaesthetic weal " of 5 per cent. procaine solution was raised over the jugular vein using a Waite's dental syringe and fine 1-inch cartridge-type needle. The form of drug used was nembutal solution in a strength of 1 grain per cubic cm. and the assessed quantity was injected fairly quickly. Following the injection, stable bandages and casting gear were applied and the animal thrown without delay.

NOTES FROM CASE REPORTS

CASE NO. 1

Subject.—An eight-year-old bay hunter mare, estimated weight 1,400 lb. A chronic " head shaker."

It was given 14 c.c. of nembutal solution.

After three minutes there was slight hind-limb inco-ordination but the animal was able to walk unaided. It stood quietly while stable bandages and casting hobbles were put on. While recumbent, there was little struggling during exploration of the ears, nostrils and mouth, during examination of the sinuses and perineural infiltration of the infra-orbital nerves. On the hobbles being released the patient got up at once.

CASE NO. 2

Subject.—A six-year-old chestnut thoroughbred stallion, estimated weight 950 lb.

It had suffered a recent fracture of the mandible with displacement of the lower incisors. It was given 9·5 c.c. of nembutal solution.

Bandages were applied immediately and the patient walked normally to the operating theatre where it stood quietly until it was thrown with hobbles. During the induction of chloroform anaesthesia there was less than usual movement. Following the

reduction and fixation of the fracture and a short period of hypnosis the animal got up easily.

Case No. 3

Subject.—An aged brown hunter gelding, estimated weight 1,200 lb.

This animal was affected with navicular disease. It was of a restive temperament and a confirmed kicker. It was given 12 c.c. nembutal solution.

It showed no inco-ordination and remained quiet while hobbles were applied. There was a minimum of resistance to the induction of chloroform anaesthesia. Median and plantar neurectomies were performed. The animal resumed consciousness and regained the standing position in the usual way.

The same subject, on a later occasion, was again given 12 c.c. nembutal solution. There was no alteration of gait. The animal did not react to the application of hobbles. It was cast and euthanasia performed.

Case No. 4

Subject.—An aged grey hunter gelding, estimated weight 1,300 lb.

The case was one of coronary sinus. The animal was given 13 c.c. nembutal solution.

It stood quietly in the standing position during perineural infiltration of the plantar nerve of the affected leg and during exploration of the sinus.

The same subject, at a later date, was again given 13 c.c. nembutal solution, prior to induction, in the standing position, of intravenous chloral narcosis. There was not the slightest movement until the animal, when deeply narcotised, was gently pulled over on to its side. Partial excision of the lateral cartilage was carried out under plantar nerve block. The period of recumbency following this degree of chloral narcosis was not unduly prolonged. The animal made an uneventful recovery.

Case No. 5

Subject.—A two-year-old thoroughbred colt of stunted growth and estimated weight 550 lb. It was believed to be a cryptorchid and kicked when the inguinal region was handled. It was given 5·5 c.c. of nembutal solution.

Following the injection it was possible satisfactorily to examine the scrotal region with no restraint other than a head collar. Stable bandages were now applied and five minutes after the injection the animal swayed slightly when walking. It stood quietly while side-lines were applied and there was little struggling after casting. Castration was followed by no untoward effect.

Case No. 6

Subject.—A four-year-old chestnut thoroughbred stallion of estimated weight 1,000 lb. It was rather difficult to catch and was admitted for castration. It was given 10 c.c. nembutal solution.

The horse swayed slightly when walked from its box, but stood quietly while being bandaged and cast. There was little struggling when recumbent and during the induction of chloroform anaesthesia. It recovered quietly from the anaesthetic and got up normally.

Case No. 7

Subject.—A yearling crossbred Arab cryptorchid, estimated weight 500 lb. It resented manipulation of its inguinal region. It was given 5 c.c. nembutal solution, after which it was possible to confirm cryptorchidism.

Chloroform was administered in the standing position and there was a minimum of reaction to its administration. Cryptorchidectomy was followed by no untoward sequel.

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BOS BRACHYCEROS OR DWARF CATTLE

BY

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(*Continued from page 396*)

Bos brachyceros in Africa

The story of these dwarf cattle in Africa will now be given. The valley of the Nile, according to Moret & Davy (1926, 116), furnishes evidence of its continuous occupation by men who practised the Acheulian type of culture and remained in this locality in comparative isolation for long periods. Concerning these times, *circa* 10000 B.C., Sir John Myers (1928, I, 35) writes : " Goats, sheep and short-horn cattle were kept, all apparently of African varieties."

It is unlikely that there ever was an African variety of short-horn. The point to notice is the existence of this species then in Africa and its breeding true to type ever since. The large breeds were not as yet domesticated and here is another point in the contention that the dwarf short-horn is not a stunt or runt among the bovines as a result of man's interferences but a true species.

By the 16th century B.C. not only had the dwarf cattle diffused among the Negroes but the larger breeds also had appeared. Forde (1927, 35) writes : " The pictures of the Hatshepsut expedition (from Egypt *circa* 1500 B.C.) make it quite clear that it (Punt) lay in Africa,* for the *fauna* consists entirely of African animals. There are cattle belonging to two different breeds, with short and long twisted horns, of which the latter is still common in Africa."

Erman (1894, 511), writing of the land of Punt in the days of the Egyptian queen Hatshepsut (1500 B.C.), says : " Amongst the houses lie small short-horned cows, and the donkeys which the people of Punt employ as beasts of burden or for riding."

Two types of cattle were also known in Ancient Egypt. Gardiner (1927, 538, 543) gives " wn*dw* " as the name for the small short-horned cattle and " mnmnt " for the large, long-horned cattle. Curson & Thornton (1936, VII, 620) give an account of the introduction of the dwarf short-horn into Africa that is worth following up : " At the end of the Neolithic era, there entered lower Egypt from Asia . . . cattle of an entirely different type, namely, the *brachyceros* or short-horn. These accompanied the invaders of Mediterranean stock. . . . As mentioned above, the first invaders of Egypt brought cattle of short-horn type, which in time displaced the Hamitic long-horn in Lower Egypt and even during the period of the New Kingdom (1500-945 B.C.) they were dominant. In the course of time their owners were also compelled to seek pastures new, and again the path to the west along the Mediterranean was reflected. As before, when opposite Gibraltar, the stream divided, one to the north into Spain, France and Great Britain and the other south along the shores of the Atlantic until the southern arm of the Gulf of Guinea was reached after centuries of travel. Representatives of this type are found to-day, not only along the Gulf of Guinea as far south as the Cameroons but around the northern part of Africa as far east as Eritrea." Against this speculative migration of the dwarf short-horn must be mentioned the fact that there is no supporting tradition among any of the present possessors of this type of cattle

* According to Professor C. M. Doke, Punt is probably the Egyptian form for Bantu and, if it is, then contacts were recorded in about 2500 B.C. (The Earliest Records of Bantu. *Bantu Studies.* Vol. 12. 1938. p. 135).

that it reached them in this manner. That the *brachyceros* is of Asiatic origin is accepted but that it reached Negro Africa in the manner described, *i.e.*, via North African and the Atlantic coasts, is rejected. The route that it entered Negro Africa is from the valley of the Nile via Kordofan, Darfur, Wadai and Lake Chad westwards and from Darfur southwards to Rhodesia, and also by sea.

Stewart (1936, 7, 12) also holds this view, for he writes : "This small breed of cattle arrived in Egypt at the end of the Neolithic era and remained the principal breed until the arrival of the zebu during the New Kingdom from 1580 B.C. This type of bovine is best known as the Celtic short-horn of Roman days. In Lower Egypt proper, the dominant bovine is still the small short-horn, an animal eminently suited to the local condition where the cattle live among the Fellaheen in the same houses.

"After entering Egypt, the short-horn cattle spread along the Mediterranean seaboard and to the south of the Sahara into the Western Sudan. The lagoon cattle of the coastal parts (of West Africa) represent the nearest modern animal to the original short-horn and these are very small indeed, very few being more than nine hands high (36 inches). . . . They are dwarfed and stunted* and their measurements are identical with the old Celtic ox."

No one, however, regards the Celtic ox as a stunted or degenerate animal. It is regarded as a true dwarf species, yet when that same species is found in West Africa it is regarded as a stunted or degenerate type. I maintain that the *brachyceros* found in Africa is a true pygmy species, and in support of this contention I shall refer to the Nupe tradition of their cattle which runs as follows according to Nadel (1946, 202) : "The cattle of the Etsu (King) of the Agaie were not, like the cattle to be seen at present in Nupe, of the northern humped breed. They were humpless and of small build, evidently related to the dwarf cattle which exist to-day in certain areas in eastern and south-eastern Nigeria. These dwarf cattle are said to have been very widespread in eastern and northern Nupe country before the Fulani conquest ; the Gbari, for example, maintain that they had owned, originally, large herds of these cattle which to-day, have almost disappeared in this region. The traditions of the Nupe speak of a magic connected with a bull or cow with which the ancestor-king, Tsoede, endowed the first Benin chiefs. The *Retsa* ritual on the Niger demanded the sacrifice of a bull, to be presented annually by the chief of Kyedye. Evidently, these rites and sacrifices could only have referred to these dwarf pre-Fulani cattle."

Tsoede is supposed to have founded Nupe in 1531 according to Nadel (1946, 406) so that these dwarf cattle were already established in Nupe before then. James Welsh was at Benin in 1590, and according to Hakluyt (IV, 303) Welsh's ships loaded up with ivory and three bullocks.

This same tradition of dwarf cattle in these regions, long before the arrival of the Fulbe from the west with their herds of large cattle, is found further east, *e.g.*, in the Yola and Bornu Provinces of Nigeria. It would have been difficult for these dwarf cattle to have reached Bornu from the north or west and all the evidence indicates that they came from the east. Migeod (1927, 11) remarks : "Though the Fulani brought with them (in their west to east migration) vast herds of fine cattle, they did not actually introduce cattle to these regions (the Yola-Bornu Provinces), for it seems that they found a breed of rather small, or dwarf cattle already in the country. . . ."

Barth (1857, II, 507), who was in this region, *i.e.*, in the kingdom of Fumbina, describes this small bovine and gives the name by which it is still known. "With regard to domestic animals, cattle were evidently introduced by the Fulbe some two or three hundred years ago : there is an indigenous variety of ox, but quite a distinct species and of a dark grey colour ; this is called maturu." Morton (1943, IV, 78), of the Nigerian Veterinary Department, writes : "A first classification of Nigerian cattle might be made as follows . . . (1) The Muturu, or dwarf cattle. . . ."

Here, again, is evidence that in these regions of Negro Africa—Nupe, British Cameroons, Yola, Adamawa and Bornu—the *brachyceros* long preceded any other type of cattle and hence could not be the stunted, dwarfed or degenerate types of other, larger cattle.

What now of other parts of Africa ? Cadamosto, who travelled into Africa in 1455 from the Senegal, according to Moore (1785, I, 435), wrote : "The cattle of this country (Budomel, 800 miles south of Senega), such as they are, are smaller than those of Italy. A red cow here is a rarity ; they are, in general, black or white ; some, however, are pied or mottled."

Crone (1937, Vol. 80, 16, 46) provides further information from Cadamosto on these dwarf cattle : "Their (the inhabitants of Cano Bianco) oxen and cows, compared with ours, are small. . . . The cows and bulls of this country (Senega, and also of all the land of the blacks) are very much smaller than ours. (I believe this is a result of the heat.) Occasionally one sees a cow with a red hide ; most are black or white or black and white mixed."

Major (1868, 253), writing on Prince Henry the Navigator and his discoveries up to his death in 1460, says : "Beyond Cape Branco was a place named Hoden, about six days camel-journey inland. . . . The inhabitants . . . lived on dates and barley, which they had in abundance. . . . They kept cows and goats, but no great number, as the soil was so barren, and their cattle were small compared with those of Venice."

Ogilby (1670, 446), writing of the Gold Coast, says : ". . . the cows and oxen are small bodyed like yearling calves, having horns standing cross : but the cows never give any milk." Speaking of the people between the Senegal and the Gambia, Sieur Le Maire, writing in 1683, says : "Their beeves are no larger than a calf of eight or nine months in France. I believe the drought is the cause, for along the river Senegal, they are as large as in Europe."* Here, for the first time on the coasts of Africa, does one meet with the large and the small breeds of cattle together.

Bosman (1907, 236), writing of the Gold Coast in the 1690s, says : "These (cattle) are so very light and small that one of the best cows in her full growth doth not weigh above two hundred and fifty pounds."

Anderson (1870, 109), who travelled into the interior of Liberia in 1868, remarked when he was at Mahommadu, about 165 miles as the crow flies from Monrovia : "A great many cattle remained unsold. . . . They are large, reddish, long-horned cattle, which one usually buys from the interior. The highlands, from which they come, explains why they do not thrive so well as the black, short-horned, and sturdy cattle of the coast, known among us as the 'leeward cattle.'"

James Barbot† was at Doni, on the Niger Delta, and in 1699 reports that the Negroes ". . . have plenty of black cattle, hogs and goats, but small, especially the cows. . . ."

Saugnier & Brisson (1792, 175, 312), writing of Senegal, say : ". . . the oxen are not half so tall or so big as those

* Mr. Stewart, in a letter to me, states he withdraws the word "stunted."

* Harleian Collection of Voyages. Vol. II. p. 609. London, 1745.

†Churchill's Collection of Voyages. Vol. V. p. 462. London, 1732.

of France, or even of Brittany. . . . The oxen above Podor produce from 100 to 140 pounds of meat." Simpson (1843, 21), writing of Sierra Leone, remarks : " The cattle were plenty but small, similar to the Guernsey breed, and of brown colour, yielding a good supply of milk."

These dwarf cattle are also reported on the islands off the coast of Africa. According to Churchill (1732, V, 466) there were : " In 1701 above a thousand blacks in the Island (of Annobon), on the several Portuguese plantations, to cultivate all manner of Guinea provisions and breed small cattle, which turns to a very good account to the proprietor, who is a Portuguese Lord that owns the island."

Johnson, who wrote in 1725, said, according to Gosse (1925, I, 115), of the island of St. Thomé : " Their Beefs are small and lean (two hundred weight or a little more). . . ."

The two types of cattle occur in south-west Africa side by side in this century. Schwarz (1921, 185) says : " The country used to be famous for its cattle. The Damaras owning countless herds of oxen. . . . The Damara ox is a large, heavy beast, in contrast to the Ovambo ox, which is little bigger than a shetland pony. . . ." Here, again, in a country that could support countless herds of the large type of ox, the presence of the dwarf cannot be attributed to its being a stunted variety of the larger breed. These dwarf cattle were reported in the 16th century on the east coast of Africa. Theal (1899, III, p. 217), in his translation of Barreto's (1572) account of the conquest of Monomotapa, writes : " There are no cows except on the coast of Melinde, and they are small." Also Theal (1898, II, p. 480), giving Fynn's account of Delagoa Bay, writes : " The cattle are not numerous in this part of the country and the principal part of them belong to chiefs. The oxen are small and in good condition, but the people have no idea of using them for draught."

Junod (1927, II, p. 47), describing the Thonga natives of the east coast of Africa, says : " Native cattle are by no means a pure breed. There are many races which have been crossed : a small race with short horns and another with large lyre-shaped horns, probably brought from the Transvaal to the coast of Delagoa Bay."

Caves and Cattle

It will have been noticed that these dwarf short-horn cattle were associated with cave dwellers in Britain ; among the Wachagga of Kilimanjaro these dwarf cattle were kept in underground byres. By kind permission of the author and of the editor of *Tanganyika Notes and Records*, Fig. 1 shows diagrammatically such underground byres. Jones (1941, No. 11, p. 11) writes : " The Wachagga were accustomed to falling back into their mountain fastnesses when raided by outsiders, and as their cattle were comparatively few and therefore valuable, some means of hiding them had to be found. These dugouts were first constructed in Rombo's district and were definitely used about 1872. . . . The approach is hidden in a banana grove and is reached by climbing down an incline of some fifteen feet to a tunnel. . . . The tunnel opens into a roomy cavern in which the cattle were housed. . . . There are indications that there was space enough for up to ten animals. Stocks of food were kept there and the cattle which even in normal times do not go outside the huts were well used to the darkness."

Dundas (1924, p. 266), writing of present-day methods, says : " Of all the stock in Chagga land over half is kept in the owners' huts and fed with grass cut in the plains and carried to the animals. . . . The stalled cattle remain in the dark huts indefinitely and subsist very largely on bananas in addition to grass. In course of time they became incapable of grazing ; often they were more or less blind, and when taken out are easily detected by their clumsy behaviour. Whether it is due to this, or to inbreeding, that the Chagga stock are almost a pygmy breed I cannot say. . . . The Wachagga have some 140,000 to 150,000 head of cattle. . . ."

Mr. Stewart, in a letter to me, writes as follows : " When

Fig. 1.—Section of Chagga village showing underground tunnels and cattle enclosures, kitchens and living quarters in time of warfare. Note underground waterway.

I visited the (Bauchi) Plateau in Nigeria in 1928, Henderson (Chief Veterinary Officer, Nigeria) I think it was, took me to two pagan villages there, where the cattle were typical *brachyceros* type, and were kept in semi-caves and were not let out to graze. The villages were at the top of what would be kopjies here (in South Africa) and had been organised for defence in the past against the Fulani and had remained so."

Fripp (1939, XVI, 87), commenting on Bishop Knight-Bruce's journey through Mashonaland in 1888, writes : " Earlier mention of 'tiny cows' needs to be read in conjunction with his subsequent description in his *Memories of Mashonaland*, where he writes (1895, 32), 'the cattle have to get through the very low doors of the Mashonaland huts ; this they do easily enough as calves, but as they grow up they have to stoop ; and when full grown they have to bend down, as a man would do, to get through a door.' This corroborates the oft-repeated (and oft ridiculed) statements of our (Rhodesian) pioneers about the 'tiny' cattle which they found here. And drawings made before the occupation exist which also confirm the statement as to their small size. The existence of similar tiny breeds in India, too, points to the need for less cursory consideration than has hitherto been accorded to the suggestion that the Inyanga-Penhalonga pit-complexes (known to have been inhabited as recently as 80 years ago, though probably by a secondary occupation) may have been the dwellings of a cattle-keeping people who kraaled their stock in the pits, driving them in and out through the tunnels."

Dent (1896, pp. 318, 35, 88), who was in Rhodesia in 1891, mentions these dwarf short-horn cattle and how, when raids were on, man and animal took refuge in caves : " . . . in Mtoko's country we saw more cattle than we had seen elsewhere, but all of the same calibre. The characteristic of all domestic animals in Mashonaland is their small size. The cows are less than our Guernsey breed, and give very little milk. . . . At an elevation of five hundred feet above our waggons were the mud huts of the people (Makaranga), and up here every night they drive their cattle into extraordinary rock stables for safety. . . . The aforesaid stream (at Umgabe's kraal) in its course down the valley, just below the village, runs underneath a vast mass of granite rocks, which form a labyrinth of caves exceedingly difficult to approach. To facilitate the entry the inhabitants have made bridges of trees, and in times of danger from the Matabele they take refuge therein ; they take their cattle with them, and pull down the bridges. . . ." One may therefore prophesy that where cattle are " caved " they are always the dwarf short-horn. It would be exceedingly difficult to get *Bos primigenius* into a cave and then to supply him with fodder and water would be an impossible task.

This ox still occurs in Rhodesia and is regarded as arriving there before the present large type of animal of the Bantu. Nobbs (1927, XXIV, 328), who was Director of Veterinary Services in Southern Nigeria, writes : " The Mashona cattle, sometimes termed Makalanga, are characteristic of Mashonaland, and it is indicative of their universality and uniformity and probably of their ancient origin that no name is given to them as a breed by the natives, who know them only as *Ngombe* or *Mombe*, that is, cattle, or at most, as *Ngombe dza Maswina*, cattle of the Mashonas, to distinguish them from other cattle. This breed the Matabele name the *Amanjanja* or *Njanja*, being the small cattle they raided from the Mashonas in contradistinction to the larger breeds they procured elsewhere. . . . The Mashona breed of cattle, as known to-day, have certainly occupied the part of the world in which it is found from a very remote period. There is no direct or traditional evidence from native sources that it has been introduced from elsewhere, but it seems particularly to be associated with the Warozwi nation, who under the first of the Mambo dynasty, came from north of the Zambezi and peopled the land for long centuries before the Matabele dispossessed them. Probably, therefore, it has a tropical origin, and this seems likely from the facts that it more closely resembles native breeds found north of the Zambezi and that the native breeds to the south and south-west of it are of a totally different stamp and, by comparison, are large, long limbed and adapted to arid and even desert conditions." Here, again, one finds the sequence dwarf short-horn migrating into Rhodesia from the north to be followed later by the larger breeds.

Nobbs (*op. cit.*, p. 333) continues : " The carcase is small, the full-grown fat ox weighs about 300 to 400, averaging 350 pounds. . . . The Mashona cattle are, and apparently always have been, of every colour, except roans and brindles. . . . The preponderating colour certainly is black, but red is also very common, also mixed black or white, red and white in various combinations, while black and tan merging into each other with a mealy mouth is a very frequent and characteristic colour. Occasionally white, dun, fawn, grey, blue-grey, yellow and slate, also black and white speckled, and red and white speckled are met with."

Concerning this type, Worthington (1938, p. 414) writes : " The East (African) coast type, including the Makalanga, are the dwarfs of South African cattle (Bischop & Curson, 1933) and the Zulu (Curson, 1934a)." The Makalanga cattle are those described by Bent and the Zulu cattle are those described by Fynn and by Junod. These are, I maintain, the true *Bos brachyceros* and not the stunts of any other types of cattle.

Rhodesia is essentially a cattle or ranching country, and Nobbs (*op. cit.*, p. 336) himself remarks on the excellence of the pastures when, commenting on the longevity of these dwarf short-horns, he writes : " . . . it is remarkable how long animals may go on after they have lost all their teeth, which says much for the nature of the herbage. . . ." Furthermore, none of the big breeds of cattle shows any tendency to become dwarf ; hence here is additional evidence to show that in Africa wherever the dwarf short-horn is found it breeds true to type and is thus a pygmy species and not a degenerate.

The study of this dwarf short-horn shows that in Britain the same sequence held. First the dwarf short-horn appeared and then afterwards the larger breeds. Lydekker (1912, 81) writes : " This small short-horned (the Celtic short horn) breed was introduced (into Britain) by the Neolithic herdsmen and farmers from the continent as a domesticated animal. The place where it was originally domesticated is unknown, but it may be inferred from the absence of any wild cattle of this species in Europe that it was introduced from the East, from some part of middle Asia into Europe. . . . These cattle were small and dark, with small horns, and were the only domestic breed in this country, so far as I know, throughout the whole of the Bronze and Iron Ages, and during the time when Britain formed part of the Roman Empire. The evidence on this point presented by the study of the refuse heaps leaves no room for doubt. These small cattle are also represented in the refuse heaps of the post-Roman period in Britain in various places. . . . There is no evidence of any large domestic cattle in Britain until the arrival of the English, who came over here with their families, their flocks and herds, and carved for themselves out of the province of Britain the land called Britain."

In June, 1771, the ship *Talbot* called at Johanna, the chief of the Comera Islands, and Clark (1792, I, 38) writes : " The bullocks and fowls, though small, are good." These cattle are also reported in India and beyond. Yule & Burnell (1903, 407) write : " Gynee, S. H. *Gaini*. A very diminu-

tive kind of cow bred in Bengal. It is, when well cared for, a beautiful creature, it is not more than 3 feet high, and affords excellent meat. It is mentioned by Aelian.

"C. 250. There are other bullocks in India, which to look at are no bigger than the largest goats. These are yoked and run very swiftly. *De. Nat. Anim.* XV. 24.

"C. 1590. There is also a species of oxen called *gaini*, small like *gut* horses, but very beautiful. Ain. 1. 149.

"1832. We have become great farmers, having sown our crop of oats, and are building outhouses to receive some 34 dwarf cows and oxen (gunees) which are to be fed up for the table. F. Parkes. Wanderings of a Pilgrim. I. 251."

The Abbé Rochon (1792, 396) reported small cattle in Cochin China. "They (the Cochinese) have, however, a great many oxen ; but they are small, lean, and almost of no use."

Dunbar (1938, 289), writing of the Abors on the Indo-Tibetan border, remarks : "All the communities own herds of mithan (small domesticated, short-horned cattle). . . ."

A map shows the Old World distribution of the *Bos brachyceros*.

Cultural Cattle-Patterns

As another indicator that the dwarf short-horn are not derived from the larger breeds of cattle may be stated the entirely different ways in which the two types of cattle are integrated into human society. If one excludes European culture, then the characteristic feature of the culture wherein dwarf short-horn cattle abound is that neither it nor its owners are nomadic. All the large breeds of cattle are, at least, seasonally nomadic. Thus there is a transhumance of the herds of the larger cattle according as the grazing areas are in different regions for the dry and wet seasons, or for winter and summer. In addition, the cattle owners of the larger breeds are often themselves migratory or nomadic. Neither transhumance nor nomadism is found with the small herds that comprise the *Bos brachyceros*.

Another culture feature that distinguishes the position of these two types of cattle in human society is the rôle they play in the presence of danger to society.

Whether the basic cultural pattern of a society be agricultural or pastoral, man in the face of danger displays mainly two types of behaviour. He either flees it or fights it, and in each type he shapes his cultural environment to support him. So far as his cattle are concerned he integrates their behaviour to conform with his own. In the fleeing type of behaviour his cattle flee with him for safety into caves or go underground. Only the *Bos brachyceros*, because of its smallness and docility, is capable of being thus integrated into this type of culture. Such, then, in brief is a culture pattern of those agriculturists who, not being nomadic, yet keep the dwarf short-horn cattle.

The cattle behaviour of the nomad pastoralists with their large breeds is very different yet the behaviour of their cattle is such that it integrates with that of their masters.

Theal (1896, 24) points out that the Hottentots ". . . had great skill in training oxen to obey certain calls, as well as to carry burdens, and bulls were taught not only to assist in guarding the herds from robbers and beasts of prey, but to aid in war by charging the enemy on the field of battle." Theal (1900, VI, 301-302) then gives an instance where such tactics resulted in the severe defeat of the Portuguese in Table Bay in 1510 when Dom Francisco de Almeida and 65 of his men were slain. "But although some of our men began to let the children go and to drop some miserable booty that they were carrying off from the village, the negroes were already so incensed that passing over all

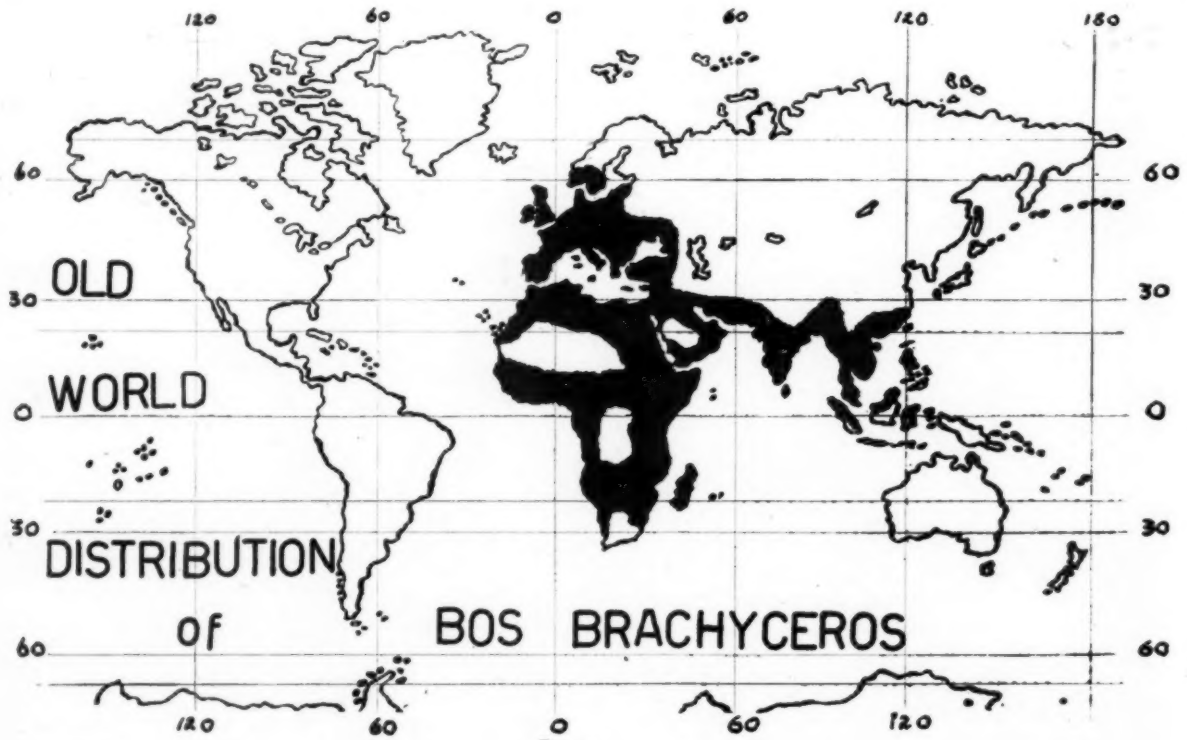

Fig. 2.

obstacles they attacked the body of our people. Having called their cattle, which are accustomed to this kind of warfare, they began to whistle to them and make signs by which they guide them, so that forming into a squadron, and sheltered by the cattle, they attacked our men with wooden darts hardened by fire. Some fell wounded and were trodden down by the cattle, and as most of them were without shields, their only weapons being lances and swords, in this kind of warfare they could not do much damage to the negroes, who, from among the cattle, hurled their weapons against our men, which had immediate effect. . . . Finally, this was the most disastrous event that took place in this kingdom, as the negroes numbered one hundred and seventy and our men one hundred and fifty, the noblest people of the fleet."

Salt (1814, 56), quoting from the Arab writer Zaneddin Omar ibn l'Wadi, says of the Negroes and their large cattle : "The land of Zinji lies opposite to that of Sind ; between the two intervenes the breadth of the sea of Persia. The inhabitants are the blackest of the Negro race ; they worship idols, are brave, hardy and fight in battle riding on oxen, as their country supplies neither horses, mules nor camels."

Father Torrend (1891, pp. 305-310) describes a folk tale wherein cattle are similarly controlled, and it is well known that the Bororo, or Cow-Fulani, of Adamawa use their cattle in charging and attacking hostile natives.

In a battle between the Sultan of Morocco and the Sultan of Songhoy, Delafosse (1931, p. 83) writes : "The *askia* (king of Songhoy) had indeed taken the precaution to have cows put between the enemy (Spanish musketeers) and his own troops, in order to cover them, but the unfortunate beasts, maddened by the fire of the musketry, took fright, precipitated themselves with lowered heads on the Songhoy warriors, and only contributed to hasten their rout, which was complete."

The two types of cattle give rise to two quite different types of reaction in the face of danger, and this difference indicates a different source or origin for the domestication of each type.

Conclusions

Sufficient evidence has now been marshalled to show that wherever the *brachyceros* is found it breeds true to type ; that it is characterised by its wide range of coloration ; that it is not a nomadic species ; that its owners are not nomadic pastoralists but settled agriculturists ; that it is not a stunt or degenerate from a larger type ; that it was the first of the bovines to be domesticated ; that it spread widely with neolithic man and that it always precedes the larger type of bovines which arrive with nomad pastoralists.

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BRUCELLOSIS

During recent years considerable progress has been made in the study of the epidemiology, diagnosis and prevention of brucellosis. These advances are described and discussed in the second report of the Joint FAO/WHO Expert Committee on Brucellosis, which has just appeared as No. 67 in the *World Health Organisation : Technical Report Series.*[1]

Thus far efforts have been concentrated on the control of bovine brucellosis, although the disease in goats and in sheep also constitutes a serious problem and a danger to man. In this report the applicability to sheep and goats of the diagnostic tests used in cattle is discussed. Also considered are the indications and contra-indications for vaccination of cattle; various diagnostic tests carried out on milk; methods for the isolation, culture and identification of *Brucella*; and problems in the diagnosis and treatment of brucellosis in man.

The activities of the 12 FAO/WHO brucellosis centres, which are making important contributions to knowledge concerning brucellosis, are summarised, and the particular subjects of study at each centre are listed.

[1] *World Hlth Org. techn. Rep. Ser.* 1953, **67.** Published in English and in French. Price 2s., $0.25, or Sw. fr. 1.—

CLINICAL COMMUNICATION

REARING ORPHAN PIGLETS WITH A FOSTER-MOTHER

N. F. TEBBUTT, M.R.C.V.S.,
OUNDLE

Subjects.—Eight blue and white piglets, whose dam died when they were from four to eight hours old. The sow was left at 4 a.m. with 11 piglets and seemed perfectly normal, at 7 a.m. she was dead after prolapsing her uterus. Two of the smaller piglets also were dead and another died later.

History.—These eight piglets were removed immediately, placed in a chaff-filled box in front of a fire and bottle-fed every two hours for the first day and part of the night.

The next morning they were introduced to an Arnold's stone jar foster-mother with eight teats and a thermostat controlling the milk temperature. The piglets quickly learned to suckle from these teats and were then placed in a small chaff-filled outhouse with an infra-red lamp.

The capacity of the foster-mother was a gallon and into this was put a mixture of half milk, half water, one heaped teaspoonful of concentrated penicillin pre-mix and one heaped tablespoonful of glucose. Once a day the penicillin was omitted and one large teaspoonful of syrupus ferri. phos. co. introduced. The penicillin was dissolved in boiled water and then added to the mixture to prevent clogging of the teats. The foster-mother was refilled every two hours during the day and put in full every night at approximately 11 p.m., then refilled at about 6 a.m.

For the first two weeks the piglets drank 20 pints of this mixture daily. At three weeks this was reduced to 16 pints. For the first 20 days the piglets thrived well and there was a marked absence of scouring. Exactly on the 21st day they all began scouring but this was controlled by individual doses of 60 minims of syrupus ferri. phos. co. mid-daily, combined with ·10 gramme sulphamezathine *b.i.d.* for three days. On the 25th day one teaspoonful penicillin pre-mix was mixed in with the meal, which was eaten in small quantities. The foster-mother was now dispensed with entirely and the milk mixture fed in a small iron trough. On the 35th day only ¼ lb. of meal was being consumed daily per head; consequently, feeding arrangements were altered and meal was fed before the milk. Meal consumption then rose rapidly and by the 49th day 1½ lb. was being eaten daily per head, together with 8 pints of milk mixture. At eight weeks old, meal was consumed at 2 lb. per head daily and only 4 pints of milk mixture, which was gradually cut out altogether. The infra-red lamp was also gradually cut altogether.

The weights of the piglets were as follows :—

Age	Largest pig	Smallest pig	Net litter average
	lb.	lb.	lb.
Birth weight	2½	1½	2½
1 week old	4	2	5½
2 weeks old	6	2½	9
3 „ „	8	4	11
4 „ „	11	6	14½
5 „ „	16	10	17
6 „ „	19	11	21
7 „ „	25	14	24
8 „ „	30	20	28·2

Average litter weight, 27·75 lb.

OBSERVATIONS

The piglets should be bottle-fed for the first day so that they can get used to sucking a rubber teat and then they take easily to a foster-mother.

Often the teat holes must be made bigger with a piece of red hot wire.

It is necessary to stress absolute cleanliness and the scalding of the foster-mother and teats. Three sets of teats were used.

It was interesting to see the marked absence of scouring until the 21st day and it would probably be policy to anticipate this by dosing the piglets at 19 days old with iron mixture and the possible use of vitamin B_{12}.

It was doubtful if the penicillin had any effect on the body growth or non-occurrence of scouring, owing to the temperature of the milk and its contact with the metal of the thermostat, but when penicillin was mixed with the meal the piglets made great progress.

Another interesting observation was the amount of milk and water mixture taken (1,360 pints).

Incidentally, four pigs had umbilical hernias, which had disappeared in all but one at nine weeks old.

At eight weeks old these piglets had the normal bloom and healthy look of good sow-reared piglets and subsequently appeared to lengthen more rapidly than the average litter on this farm.

The approximate cost for each piglet (excepting labour) was £2 17s. 6d., which was calculated as follows :—

Total Costs for Eight Piglets

	£	s.	d.
Milk, 480 pints at 7½d. per pint	15	0	0
Meal, 2 cwt. at £2 per cwt.	4	0	0
Straw, six bales at 1s. 6d. per bale		9	0
14 lb. glucose	1	8	0
Syrupus ferri. phos. co.		3	0
Penicillin	1	0	0
Electricity (approx.)	1	0	0
	£23	0	0

In this case the expenditure of extra time and trouble also was justifiable, and the whole procedure appeared economically successful.

AUSTRALIAN CATTLE INDUSTRY

The President of the Aberdeen-Angus Breeders' Society of Australia, Mr. Gordon Munro, has suggested the reorganisation of the Australian cattle industry. Mr. Munro owns a large Aberdeen-Angus stock property in north-western New South Wales, and says that the Australian beef industry lags behind the U.S.A. in its selling organisation. So far, he said, Australia had been unable to modernise her beef-marketing methods. The grading of meat for local consumption, as well as for export, would greatly aid the consumer and the producer by providing a degree of standardisation which was essential for orderly marketing and efficient distribution. If Australia was to benefit from an expanding British market and other markets, an organisation for the efficient distribution of her meat in these countries was essential. Reforms in marketing, processing and distribution methods should begin now.—*Meat Trades Journal.*

* * * * *

WEEKLY WISDOM

The peace we seek, founded upon decent trust and co-operative effort among nations, can be fortified—not by weapons of war—but by wheat and by cotton; by milk and by wool; by meat and by timber and by rice. These are words that translate into every language on earth. These are needs that challenge this world in arms.—PRESIDENT EISENHOWER.

ABSTRACTS

The Impact of Protozoa on World Economic Problems*

Professor Shortt, of the London School of Hygiene and Tropical Medicine, discusses "The Impact of Protozoa on World Economic Problems" and quotes Hornby as stating that trypanosomiasis has the unique distinction of being the only disease which *by itself* has denied vast areas of land in Africa to all domestic animals except poultry—up to one-quarter of the land surface of the continent. The three main groups of trypanosomes (*vivax*, *congolense* and *brucei*) are, in Africa, normally transmitted cyclically by tsetse flies but direct mechanical transmission by other biting flies may also be of importance. Thus, for example, *T. vivax* is established in South and Central America where tsetses do not occur. Mortality due to trypanosomiasis may amount to 100 per cent. in many areas, but in others condition may be lost and the cattle succumb to other hardships or infections. Indirect losses occur through inability to stock otherwise admirably suited grazing and, in consequence, overstocking of land free from tsetses with resultant increase in tick-borne and helminth infections, and also greatly accelerated soil erosion through overgrazing.

Control measures against the vector may be direct, as with insecticides, which may be of value against species such as *Glossina palpalis* with a limited "riverine" distribution, but inordinately expensive against such species as *G. morsitans*—widely dispersed over large areas. Indirect measures against fly may have a wider and more useful application: such as selective clearance of bush under skilled supervision in the case of riverine tsetse, and settlement and cultivation of fly-infected areas in the case of the more widely dispersed species, *G. morsitans*. The preservation and improvement of water supplies is of paramount importance in Africa, and indiscriminate removal of blocks of forest or fringes of forest along river courses is indefensible if it can be avoided. Possibly chemical means of destruction of tsetses along the edges of sharply cut corridors in the forest would suffice, the corridor giving access to the river for watering. *G. morsitans* is essentially a game fly and goes where game goes. In this way agricultural development and settlement will remove it. As food it prefers game to cattle, and cattle to men, but the mere destruction of game without alteration of the other conditions suitable for *G. morsitans* might merely substitute cattle as a perfect alternative to game. On the other hand, agricultural development means an increase in the human population, with consequent changes in the fly's environment, until an increase in the population up to 200 or over per square mile will so alter conditions as to eliminate *G. morsitans*.

In considering the control of tsetses it should not be forgotten that mechanical transmission by biting flies may also be important. *T. evansi* of horses is transmitted wholly by this means.

Direct measures against the trypanosomes include treatment of infected animals as with dimidium or prophylactic treatment with either dimidium or "antrycide." The latter rather readily induces the development of drug resistance by the trypanosomes and possibly the spread of resistant strains.

In discussing the piroplasms most attention is paid to East Coast fever, most prevalent in well-grassed areas with high rainfall and widely distributed on the eastern side. Study of the records of the Kenya Veterinary Department shows that diseases due to piroplasms, chiefly East Coast fever, are responsible for 51 per cent. of all diagnoses of disease-producing organisms.

As no drugs are known with effect against any species of *Theileria*, control measures have to be directed against the tick vectors, *Rhipicephalus* spp. These methods are dipping, hand dressing and fencing which, under strict supervision, are economically sound on valuable dairying land and can reduce the tick population over very large farms to proportions that are no longer a menace to the herds.

In general consideration of the problems man is to be regarded as just one unit in the vast complex of nature, and if he eliminates all the pests and diseases which afflict him he may multiply and eat up the earth and so destroy himself as the result of his success. Thus, also, complete removal of trypanosomiasis or piroplasmosis might give rise to soil erosion. Control of these diseases should be used to reduce overstocking of areas free from these diseases rather than to increase the total head of cattle. Shortt finishes his review by quoting H. E. Hornby as follows: "The point to be driven home is that animal husbandry demands both pasture management and disease control. Improvement of pastures often encourages parasites by giving these protection from the sun, therefore it must be accompanied by disease control. This alone leads to overstocking, so it must be accompanied by pasture management to save the soil."

An editorial review of Shortt's article in the same issue of the *B.M.J.* comments: "One of the vital problems of our age is to grow enough food for an increasing world population. This necessitates not only a progressive expansion of agriculture and animal husbandry but also the protection of crops and food animals from losses due to diseases, among which those caused by protozoa are often devastating. In West Africa alone, bovine trypanosomiasis is believed to cause an annual loss of more than £1,000,000 through the death of livestock. This diminishes the vitality of the native population because of the serious deficiency of their diet in high-grade protein and a steady deterioration of the fertility of the soil in the absence of beasts. These factors are causing a progressive impoverishment of the people, while medical and administrative policies are encouraging a steady growth of the population." The examples of loss quoted related only to one host in selected localities. In the U.S.A., for example, the annual losses due to protozoal infections have been estimated at $10,000,000, half of which was attributed to poultry coccidiosis—a disease prevalent throughout the world.

Another editorial article on an allied subject in the same issue of the *B.M.J.* discusses "How Drugs Act on Trypanosomes," and the various trypanocidal compounds are divided into certain broad groups according to their type of action. One such group is formed by the well-known arsenical compounds (*e.g.*, neoarsphenamine), acriflavine and stilbamidine. These drugs are highly active *in vitro* and when given to infected animals they kill most of the parasites in a few hours. They are avidly absorbed by the trypanosomes, so that the concentration inside the parasite becomes several hundred times as great as that outside, and thus the compound becomes well placed to exert its toxic action. The arsenicals have a selective combination with sulphydryl groups which probably blocks important systems of enzymes involving glutathione and similar compounds.

Another group of compounds is formed by suramin, phenanthridinium compounds (*e.g.*, dimidium bromide) and "antrycide" which resemble each other in many aspects of their biological activity. But they do not all act on the same point in the parasite, since a trypanosome which has been made resistant to one of these compounds is not always resistant to the others. These substances have no significant action on trypanosomes *in vitro*, and when administered to infected animals they take one or more days to remove the

* **The Impact of Protozoa on World Economic Problems.** Shortt, H. E. (1951). *B.M.J.* **4740.** 1103-1110.

trypanosomes from the blood. These compounds might make the trypanosomes non-infective to other animals—possibly through inability to multiply.

Ormerod has shown that "antrycide" causes the appearance of basophile and slightly fluorescent inclusion bodies in the cytoplasm of the trypanosome. Similar inclusion bodies follow effective doses of suramin and phenanthridinium and can be shown to contain ribonucleic acid and protein. Ormerod suggests that "antrycide" and suramin penetrate slowly into the cell where they are retained because their molecules carry a permanent electric charge; that their action is chiefly on the cytoplasm and not on the nucleus; and that they inhibit the growth and division of trypanosomes by preventing the normal interaction of protein with ribonucleic acid. Much of this conception is speculation rather than established fact but may prove a stimulus to further work on the mysteries of intracellular reactions.

J. S. S.

QUESTIONS IN PARLIAMENT

Cruelty to Animals (Prosecutions)

Mr. Peter Freeman (June 18th) asked the Secretary of State for the Home Department how many prosecutions have taken place under the Cruelty to Animals Act since it was first introduced in 1876; and how many have been made since the war and in 1952.

Sir D. Maxwell Fyfe: My consent is required only to prosecutions under the Act against licensed persons. There has never been such a prosecution.

Mr. Freeman: In view of the fact that, during 77 years, there have been more than 50,000,000 experiments on living animals, many of which have been the cause of gross cruelty to the animals concerned, is not this Act a farce when there has not been a single prosecution over the whole of those 77 years?

Sir D. Maxwell Fyfe: I disagree profoundly. In point of fact, the opposite is demonstrated. Offences serious enough to justify prosecution do not occur because the Act is honestly observed to the best of their ability by those who work it, and because the inspectors are able to help licensees to understand and observe the limitations imposed upon them and so prevent major infractions of the terms of the licences.

Mr. Freeman: Is it not obvious, then, that the animals concerned have no protection whatsoever, in view of the gross forms of cruelty that have been reported from time to time?

Sir D. Maxwell Fyfe: No; and I do not agree with the premise on which the hon. Gentleman is asking the question.

Sir H. Williams: Is it not the case that the bulk of the millions of operations to which the hon. Member for Newport (Mr. Peter Freeman) refers are, in fact, nothing more than minor operations involving nothing more serious than a prick such as one would get from a thorn when gathering a rose; and is not this propaganda absolutely monstrous?

Mr. de Freitas: Is it not the fact that the limitations and restrictions imposed by the Home Office under the Act under which they operate are extremely severe, so that it is almost impossible to bring a case of cruelty?

Sir D. Maxwell Fyfe: Yes, I entirely agree.

Polled Cattle (Breeding)

Mr. de Freitas (June 18th) asked the Minister of Agriculture whether he will give greater encouragement to the breeding of polled cattle.

Sir T. Dugdale: With the help of my Department private breeders are already engaged on the breeding of polled cattle of the Hereford, Sussex and Lincoln Red breeds. In addition, the Agricultural Research Council is carrying out an experiment in breeding polled Ayrshires. I am always ready to offer the same facilities to any other breeders who are prepared to undertake this very long-term project on scientific lines and with proper control.

Mr. C. Williams: Is my right hon. Friend aware that South Devon cattle are far better than any form of polled Angus?

Sir T. Dugdale: That is a matter of opinion.

Mr. C. Williams: Not at all.

NOTES AND NEWS

Diary of Events

July 7th.—Special Joint Meeting of the Lincolnshire and Eastern Counties Divisions, B.V.A., at the Grand Hotel, Peterborough, 2.30 p.m.

July 9th.—Special Meeting of Council, B.V.A., at the Connaught Rooms, Great Queen Street, Kingsway, W.C.2, 11 a.m.

July 15th.—Summer Meeting of the Lancashire Division, B.V.A., at Aintree, 3 p.m.

July 15th.—Meeting of the Editorial Committee, B.V.A., 2 p.m.; Executive, 3 p.m.

July 16th.—Annual General Meeting of the Association of Veterinary Teachers and Research Workers (Northern Region) at the Veterinary Investigation Centre, Quarry Dene, Weetwood Lane, Leeds, 11 a.m.

July 17th.—Annual General Meeting of the Association of Veterinary Teachers and Research Workers (Southern Section) at the Rothamsted Experimental Station, Harpenden, Herts, 11.15 a.m.

July 23rd.—Meeting of the Midland Counties Division, B.V.A., at Nuneaton (The Newdigate Arms).

July Meetings of B.V.A. Council and Committees

At 36, Gordon Square, London, W.C.1

Wednesday, July 29th, 1953.
11 a.m., Organising Committee.
2.15 p.m., Home Appointments Committee.
4 p.m., Parliamentary and Public Relations Committee.
Thursday, July 30th, 1953.
10 a.m., Veterinary State Medicine Committee.
12.30 p.m., Finance Sub-committee.
2 p.m., General Purposes and Finance Committee.

At the Connaught Rooms, Great Queen Street, W.C.2

Friday, July 31st, 1953.
11 a.m., Council meeting.

Aug. 9th—15th.—XVth International Veterinary Congress, Stockholm, Sweden.

Sept. 6th—12th.—Seventy-first Annual General Meeting and Congress of the British Veterinary Association, at Aberdeen.

* * * * *

PERSONAL

Appointments.—The post of Research Officer at the Research Institute (Animal Virus Diseases), Pirbright, Surrey, recently advertised in this journal, has been filled by the appointment of Mr. T. W. F. Pay, B.Sc., M.R.C.V.S. Mr. Pay, who is a Lecturer in the Department of Pathology at the Royal Veterinary College, N.W.1, takes up his new duties at the beginning of July.

The appointment, in the Colonial Veterinary Service, is announced of Mr. I. MacInnes Macfarlane, M.R.C.V.S., as Veterinary Officer, Nigeria.

Flood Disaster: R.S.P.C.A. Awards.—We learn with pleasure that Mr. N. St. C. Mead, M.R.C.V.S., of Leigh-on-Sea, and Mr. H. Loveless, M.R.C.V.S., of Clacton, have been awarded the "R.S.P.C.A. Special Service Medal" in bronze for meritorious service in the recent flood disaster on the East Coast.

* * * * *

R.C.V.S. OBITUARY

Bolton, Digby, Colonel R.A.V.C. (retd.). Graduated Edinburgh, December 13th, 1895. Died June 18th, 1953; aged 82 years.

The Late Colonel C. H. S. Townsend

Memorial Service at Fairford

On Friday, June 5th, a large and representative congregation paid their last tribute of affection and respect to the late Lieut.-Colonel C. H. S. Townsend at a memorial service held at St. Mary's Church, Fairford.

The Vicar, the Rev. E. Keble, conducted the service, and in the course of a moving tribute said, "On many a Sunday I have seen Clarence Henry Southgate Townsend with his family joining here in the children's service. Most children are taught Sunday by Sunday by their own parents that grown-ups do not do that sort of thing. Without a single word 60 children here have learnt otherwise, when a man, a real man, free from any touch of affectation, did that simple act of homage to God."

Family mourners present at the service were: Mrs. S. Townsend, Major and Mrs. C. W. Townsend, Lieut.-Colonel G. J. and Mrs. Kidston-Montgomerie, and Miss Kidston-Montgomerie.

Others present included:—

Earl Bathurst, Lady Apsley, Hon. G. Bathurst, Lord Yarborough, Lord Worsley, Lord and Lady Wright and Miss Taylor, Lady Mary Rose-Williams, Miss F. Phillips (representing the Duke and Duchess of Norfolk), General Sir Clement Armitage, Brigadier A. G. Heveningham and Colonel J. Clabby (representing the Colonel Commandant and all ranks of the Royal Army Veterinary Corps), Colonel R. M. Bamford, M.R.C.V.S., Mr. L. Constance, M.R.C.V.S., Mr. G. L. Barker, M.R.C.V.S., Mr. J. R. Brain, M.R.C.V.S., and Mrs. Brain, Major A. C. Fraser, M.R.C.V.S. (also representing Messrs. Gill and Partners), Mr. L. St. Bel Golledge, M.R.C.V.S. (also representing the Society of Practising Veterinary Surgeons), Colonel V. Gibbs and Mr. and Mrs. G. P. Male, together with representatives of many Hunts, Horse Shows and Societies.

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ROYAL ARMY VETERINARY CORPS

Officers' Club Annual Dinner

The annual dinner of the R.A.V.C. Officers' Club was held at Grosvenor House, Park Lane, W.1, on Friday, June 12th, 1953. Brigadier A. G. Heveningham, C.B.E., Director, Army Veterinary and Remount Services, presided and General Sir Ouvry L. Roberts, G.C.B., K.B.E., D.S.O., M.A., Quartermaster-General to the Forces, Professor R. E. Glover, President of the Royal College of Veterinary Surgeons, and Mr. A. M. Graham, President of the British Veterinary Association, were guests of the evening.

The following officers were also present, a total of 71 in all:—

Brigadiers J. J. Kane, O.B.E., G. A. Kelly, C.B., H. S. Mosley, D.S.O., C. A. Murray, C.B.E., E. S. W. Peatt, O.B.E., J. J. Plunkett, C.B.E.

Colonels H. E. Gibbs, D.S.O., C. Holland, M.C., J. J. Mills, W. L. Sinton, M.B.E., W. H. Walker, D.S.O., O.B.E., P. F. Woodland.

Lieut.-Colonels V. A. Bartrum, O.B.E., J. Bell, J. Clabby, M.B.E., L. W. Coulden, J. L. Dalzell, B. C. M. Edmonds, J. Hickman, J. A. Langley, J. H. McGhee, L. H. B. Poer, M.C., J. McL. Ross, M.B.E., W. M. Rouse, D. F. G. Smith, O.B.E., J. Sealy Green, D. I. C. Tennant, G. F. Watkins, H. B. Williams, O.B.E.

Majors P. Baines, W. Blanshard, E. Brayley Reynolds, O.B.E., T. B. Crawford, J. J. Dunlop, M.C., D. C. E. Danby, C. Davenport, O.B.E., A. V. Franklin, T.D., C. G. Farmer, G. F. Kershaw, J. Going, D. C. Henderson, R. W. Hartley, W. F. Jarratt, T. M. Leach, E. H. Lewis Bowen, T. Lishman, J. McCunn, I. Maclaren, I. S. Maclennan, R. I. Macrea, H. P. J. Murray, G. T. Newport, M.B.E., J. R. Steevenson, D.S.O., T. L. Shea, E. Wallace, A. A. Wilson, G. D. Young, M.B.E.

Captains W. A. Gibb, K. A. Haines, M.B.E., G. Hamilton Dick, P. J. Mitchell, O. Murch, W. Richey, M.B.E., J. Stratton.

Lieutenants W. McLeod, T. A. R. Chipperfield, O. G. Jones.

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Mrs. Heveningham "At Home"

Mrs. A. G. Heveningham was "At Home" to officers of the Corps and their ladies in the King Charles Suite, 4, Whitehall Court, London, S.W.1, on Friday, June 12th, 1953.

The following were present at this happy gathering, the seventh to be held since the war:—

Mrs. J. J. Aitken, Miss Aitken, Mrs. H. Allen, Lieut.-Colonel and Mrs. V. A. Bartrum, Major and Mrs. W. Blanshard, Lieut.-Colonel and Mrs. J. Clabby, Lieut.-Colonel L. W. Coulden, Major and Mrs. T. B. Crawford, Major and Mrs. C. Davenport, Major J. Dunlop, Lieut.-Colonel B. C. M. Edmonds, Captain and Mrs. K. A. Haines, Captain and Mrs. G. Hamilton Dick, Brigadier A. G. Heveningham, Lieut.-Colonel J. Hickman, Miss A. Hodgins, Colonel and Mrs. C. Holland, Miss J. Holland, Lieutenant O. G. Jones, Captain and Mrs. P. Jenkins, Brigadier and Mrs. J. J. Kane, Brigadier and Mrs. G. A. Kelly, Lieut.-Colonel and Mrs. J. A. Langley, Major T. Lishman, Major R. I. Macrea, Major J. McCunn, Major I. Maclaren, Major and Mrs. I. S. Maclennan, Lieutenant W. McLeod, Captain and Mrs. P. J. Mitchell, Colonel and Mrs. J. J. Mills, Brigadier H. S. Mosley, Major and Mrs. H. P. J. Murray, Brigadier and Mrs. C. A. Murray, Captain O. Murch, Lieut.-Colonel and Mrs. J. H. McGhee, Mrs. M. O'Donel, Miss D. O'Donel, Brigadier and Mrs. E. S. W. Peatt, Miss N. Peatt, Brigadier J. J. Plunkett, Lieut.-Colonel L. H. B. Poer, Captain and Mrs. W. Richey, Lieut.-Colonel and Mrs. W. M. Rouse, Lieut.-Colonel and Mrs. J. McL. Ross, Lieut.-Colonel and Mrs. D. G. Smith, Major and Mrs. T. L. Shea, Mrs. Tillyard, Colonel W. H. Walker, Lieut.-Colonel and Mrs. G. F. Watkins, Colonel and Mrs. P. F. Woodland, Lieut.-Colonel and Mrs. H. B. Williams, Major and Mrs. G. D. Young.

ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Anthrax:

Ches.—Barrow Hall Farm, Barrow, Chester (June 16).
Cornwall.—Hurdon Farm, Launceston (June 15).
Lancs.—Waterside Farm, Out Rawcliffe, Preston (June 15).
Northants.—Perio Meadows, Southwick, Cotterstock (June 16).
Somerset.—Home Farm, Tyntesfield, Wraxall, Bristol (June 16).

Fowl Pest:

Buckingham.—The Bungalow, Pulpit Lane, Oving, Aylesbury (June 18).
Cumberland.—Field in Silloth Road, Wigton; The Forge, Pelutho, Silloth, Carlisle, Easton Bridge, Drumburgh, Carlisle (June 16); Kinkry Hill Park, Roadhead, Carlisle; Stowey Beck, Brigham, Cockermouth (June 17).
Derbys.—Langley House, Marlpool, Heanor (June 16).
Essex.—Church Farm, Burrs Road, Clacton-on-Sea (June 15).
Glouc.s.—Tockington Park Farm, Almondesbury, Bristol (June 17); Gables Farm, Moreton Valence, Gloucester (June 18).
Hereford.—Pullaston Cottage, Callow (June 18).
Kent.—Pineham Bottom Farm, Whitfield, Dover (June 15).
Lancs.—Poultry Pen at Turf Meadow, Littleborough (June 16); Old Rake, Bacup (June 17).
Lincs.—Home Farm, Uffington, Stamford; Cranesgate, Whaplode Fen, Spalding; 14, Counthorpe, Little Bytham, Grantham (June 16).
London.—20, West Square, St. George's Road, S.E.11 (June 15).
Middx.—11, Smallholding, Clock House Lane, Ashford (June 17).
Norfolk.—Crows Hill Allotments, Shipdham, Thetford (June 16).
Nottingham.—124, Derby Road, Langley Mill, Nottingham (June 16); Eel Hole Farm, Watnall (June 18).
Salop.—Walnut Bungalow, Higher Heath, Whitchurch (June 15); Laburnham House, Prees Green, Whitchurch (June 17).
Sheffield.—43, Anan Road, Sheffield, 10.
Yorks.—28, Crawford Street, Walsden, Todmorden; 8, Thorn Bank, Mytholmroyd (June 16); Prospect Farm, Ellerton; Underbank, Sedbergh; Smallholding, Sunnybank Road, Mirfield (June 17); 18, Wheatlands, Ilkley (June 18).

Swine Fever:

Derbys.—Edge Farm, Park Head, Crich (June 16).
Glos.—Piggeries at Berkeley Heath, Berkeley (June 16); Hillside View, Harrowhill, Drybrook (June 17).
Hants.—Fair View, Vernham Dean, Andover (June 18).
Herts.—Hillside, Chrishall, Royston (June 17).
Hunts.—Dalkeith Farm, Winwick (June 16).
Leics.—Sparkenhoe Piggeries, Desford Lane, Kirby Muxtol (June 16).
Lincs.—Bridge Farm, Donington (June 16); Forman's Farm, Mill Street, Market Rasen (June 18).
Lothian.—Almond Side, Birdsmill, Broxburn (June 17).
Montgomery.—The Pwll, Maesbrook, Llanymynech (June 17).
Norfolk.—Pye's Meadow, Sandpit Lane, Woodton; Town Street, Upwell (June 16); Yew Tree Farm, Rackheath, Norwich; Ash Tree Farm, Saham Hills, Thetford (June 18).
Northants.—Grange Farm, Earl's Barton (June 18).
Notts.—Drowe Piggeries, Blenheim Lane, Hucknall (June 17).
Suffolk.—Brooklyn, Wangford, Nr. Beccles (June 18).
Sussex.—Chyngton Farm, Seaford; The Piggery, Court House, High Street, Rottingdean (June 18).
Yorks.—Corner Farm, Ulrowe, Driffield (June 17); Tan House Farm, Northowram, Halifax (June 18).

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POULTRY STOCK IMPROVEMENT PLAN

The Ministry of Agriculture has announced changes in the Poultry Stock Improvement Plan. These include: The "Approved" section of the plan, intended for hatcheries and their suppliers who wish to work in close co-operation, to begin on December 1st next. Full details are to be published soon. In the Accredited section, a separate class for incrosses and incrossbreds will be included in the commercial stock suppliers' grade for egg production.

A revised breeders' grade for egg production will be introduced in the accredited section. Breeders who wish to be accredited in this grade will be required to submit a number of their pullet stock for testing for egg production. Conditions of the revised grade and of the arrangements for testing will be announced in the autumn.

THE FARMERS' COMPANY

The following officers of the Farmers' Company have been elected for the year 1953-54: Master, Sir Richard Haddon; Senior Warden, Mr. V. H. Parker; Junior Warden, Mr. W. J. Cumber. The following have been elected to fill vacancies on the court: The Rev. Cyril Cresswell, Mr. G. C. H. Matthey, Mr. E. G. Parsons, Mr. C. L. Pendlebury and Mr. H. C. Tinsley.

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

BOVINE INFERTILITY

Sir,—Mr. Edgson's letter in your issue of June 13th refers to two aspects of bovine venereal infection. Firstly, clinical recovery when the animal may remain infected, and secondly, complete recovery with the absence of infective organisms.

In our paper we merely stated that spontaneous recovery occurred from *Vibrio foetus* and trichomonad infections if the cows were allowed to go through a number of oestrous cycles without reinfective coitus. As this has been recommended as a method of treatment by a number of authorities one can surely accept it.

Mr. Edgson's letter does, however, raise an interesting point. If one accepts the suggestion put forward by him that there is a tolerance which implies immunity on the part of the cow, or a diminution in virulence of the organism which develops after a time, why is it that this tolerance is not extended to the bull as well? It would be rather strange if there was a sex difference in antibody development unless the difference was related to sex hormones.

The fact that *V. foetus* or trichomonad infections can persist in a herd for long periods may, we suggest, be explained in another way. When an infected bull is serving cows, some of these will, without doubt, become pregnant at the first or second service, and therefore remain continuously in the luteal phase. Such animals would be expected to retain the infection right through to abortion or full term as the case may be and remain infective afterwards. In our opinion it is these cows which are the danger and which should be borne in mind when treating outbreaks of herd infertility due to venereal disease.

We quite realise that much of this possible link between hormones and resistance to venereal disease is speculative. In fact, this was clearly indicated in our paper, but it does appear that such an explanation would fit in with existing information regarding such infections.

We have, in addition, some further supporting evidence which it is not proposed to publish for the time being, as it is considered insufficiently conclusive until further data has been accumulated.

This work was undertaken as a sideline in order to discover why transplantation of ova via the cervix has so far failed, and the fundamental reasons for resistance to disease during oestrus must at present be left to other workers to unravel.—Yours faithfully, L. E. Rowson, G. E. Lamming, Cambridge., *June 16th*, 1953.

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TREATMENT OF WET ECZEMA AND PURULENT OTORRHOEA

Sir,—In the extremely painful weeping type of eczema case where there has been resistance to usual types of treatment, I have had marked and consistent results in using a 50 per cent. aqueous-alcoholic solution containing 0·1 per cent. phenylmercuric dinapthylmethane disulphonate (Penotrane tincture).

Using this treatment over a period of nine months in a total of 50 cases (20 cases closely watched as in-patients) in both dogs and cats, there was no case which did not respond.

The tincture was dabbed on to and liberally soaked into the affected parts twice daily. In most instances there was a marked drying of the areas within two or three days and a considerable lessening of pain and inflammation after the second application. The most obstinate cases responded in 10 days at the most. The patients did not object to the treatment and there were no apparent toxic effects. Healing seemed to be much more speedy than usual and the treatment was pleasant to use from the attendant's point of view. Although laboratory tests were not carried out, some of the cases appeared to be of a fungoid nature. The treatment was equally effective in the typical scrotal and interdigital locations of eczema.

The properties of Penotrane are listed as:—

1. Fungicidal and bactericidal.
2. Exceptional penetrating powers into both living and dead tissue.
3. Equally effective in the presence of blood, pus and body fluids.

It will also be of particular interest to those who read the paper and discussion on "Some Aspects of Ear Disease in the Dog" (*Vet. Rec.*, 1953, **65**, 382) to know that in purulent, foul-smelling otorrhoea of a chronic nature Penotrane tincture gives exceptionally consistent results.

The method of application in these cases was to fill the external canal with the fluid, massage gently for half a minute or so, then to remove surplus with cotton-wool. This brought away discharges and deep-lying debris. The foul smell and discharges stopped in from three to seven days and the secondary eczema often associated around the flap of the ear also cleared up.

The above treatment was carried out on 11 different cases, mainly spaniels and poodles that had failed to respond to other treatments, and the results were consistently speedy.—Yours faithfully, A. Stewart Rich, 342, South Lambeth Road, London, S.W.8. *June 19th*, 1953.

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ELECTRIC EUTHANASIA

Sir,—Your reports and letters on electric euthanasia induce me to describe the method used in Israel (Euthanasia of Dogs by Electricity, by F. G. Sulman, *Refuah Veterinarith*, **6**, 39-40, January, 1949). We work with alternating current of 220 volts, 50 cycles per second. No assistance is required, the dog being tied by a cord or its leash to a table leg or similar object. The last 50 cm. of an insulated wire are freed of its insulation and dipped into water before use. One wire is tied around the dog's neck and the other around its abdomen. These wires are brought in contact with the mains via a wall switch. Functioning of the device is thus indicated by lighting of the lamp connected with the switch; no short circuit is possible.

The passage of a current of one second's duration is sufficient to stop cardiac action and respiration in small dogs, whilst in large dogs 10 to 20 seconds are necessary. The usual effect produced by electrocution is dramatic: the dog drops down with outstretched limbs and life appears to cease instantaneously.

The advantages of this method of euthanasia are: No assistance is required; there is no struggling with the dog; it is rapid, reliable and real "euthanasia."—Yours faithfully F. G. Sulman, The Hebrew University, Hadassah, Medical School, Jerusalem. *June 12th*, 1953.

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SWINE FEVER (CRYSTAL VIOLET VACCINE)

(*Questions in Parliament*: *The Veterinary Record*, *May 30th*, 1953)

Sir,—Under the heading "Swine Fever (Crystal Violet Vaccine)" I read with apprehension that "considerable progress has been made between the Ministry of Agriculture, B.V.A. and N.F.U. on the possibility of introducing a scheme to ensure a more extensive use of crystal violet vaccine."

If this is true, a timely warning to the B.V.A. negotiators is overdue.

It is plain sense that in matters of this nature of direct concern to the majority of veterinary surgeons in country practice (and that means the majority of veterinary surgeons in Great Britain) the proposals advanced in our name should have either our sanction or the probability of such before we are in any way committed to a scheme.

If, in the absence of consent, we are confronted with a scheme which the several parties have agreed to impose, the B.V.A. is heading straight for trouble which will rock it on its foundations.

The Eastern Counties Veterinary Society, founded as it was 12 years before the advent of *The Veterinary Record*, has lately voiced its disfavour of a flat rate scheme for work so very varied in execution as swine inoculations. We are both prepared and willing to vaccinate all the pigs in East Anglia at a price which is fair and well within the pig-keepers' capacity to pay.

Ours is a liberal profession—it is the intention of members that it shall not become a vassal of the Ministry of Agriculture or National Farmers' Union.

Government by the consent of the governed is a tenet not lightly to be discarded; and we don't like little Caesars.—Yours faithfully, N. F. Pollock, Long Planting, West Runton, Cromer, Norfolk. *June 15th*, 1953.

[Negotiations are taking place between the Ministry of Agriculture, the N.F.U. and the B.V.A. regarding the possibility of introducing a scheme for the more widespread use of crystal violet vaccine. It should be clearly understood, however, that before any commitment is made the details of any scheme will have to be submitted to, and approved by, Council.—*Editor.*]